TITLE OF THE INVENTION

Universal Camera Mount

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is directed to camera mounting systems and, in particular, a camera mount apparatus incorporating a security device for use in theft prevention.

2. Background Art

Product displays in consumer electronic stores often incorporate security systems that simultaneously allow consumers to examine and test fully functioning consumer electronic products without exposing the store owner to a risk of theft. Such security systems may simply involve attaching a retractable tether from the consumer display to the consumer electronic product. More advanced systems may also incorporate an electronic alarm system that alerts store personnel in the event the tether becomes disconnected either from the product or from the product display.

Handheld cameras are ubiquitous in most, if not all, consumer electronic stores. A great majority of cameras today, including both still and video cameras, incorporate a number of features to distinguish one product over another. Because of this, consumers prefer to handle and manipulate a camera, prior to purchase, to determine if the features embodied in a particular model are suitable

for the consumer's intended use. It is no coincidence, therefore, that thieves are particularly attracted to stealing handheld cameras because the devices are easily accessible, expensive and portable. In response, store owners typically attach an electronic anti-theft device along with a tether to the cameras on display.

Attaching anti-theft devices and/or tethers to cameras is not without difficulty. For example, cameras are often so small that a dedicated portion of the camera for attachment of an anti-theft device doesn't exist. On the other hand, larger cameras have more surface area available to attach an anti-theft device using traditional means of industrial strength double-sided adhesive tape, but the surfaces of modern camera housings are often so curved that effective attachment of an anti-theft device is questionable. Surely the solution to these problems might include: (1) reducing the "footprint" of the anti-theft device to either fit a smaller camera or to minimize the effect of the housing contours on a larger camera, or (2) for larger cameras, designing and fabricating anti-theft devices that better match the contours of each individual camera model.

Unfortunately, taking either of these avenues presents new problems. First, anti-theft devices attached using double-sided adhesive tape to cameras depend on maximum surface area contact to ensure a sufficient resistive force to thwart potential thieves. Therefore, reducing the size of the anti-theft device negates this goal. Second, the necessity of designing and inventorying endless shapes for anti-theft devices housings make the latter solution obviously impractical.

There are other disadvantages to prior art anti-theft devices aside from attachment issues. For example, electronic anti-theft systems have the disadvantage of not being universally mountable on cameras made by all manufacturers while cable tether anti-theft systems can be defeated by simply severing the cable.

It is, therefore, an object of the present invention to provide a universal camera mount that obviates the need to inventory many variations of mount to accommodate the varying camera shapes available for sale.

Another object of the present invention is to simplify the installation of an anti-theft monitoring device to a camera being monitored.

Another object of the present invention is to provide a means to permit consumers to handle cameras on display for sale while simultaneously preventing theft of the handled camera.

These and other objects of the invention will become apparent via the following specifications and claims.

SUMMARY OF THE INVENTION

The present invention overcomes the disadvantages of prior art anti-theft devices by incorporating an electronic anti-theft assembly in combination with a universally mountable member. The electronic anti-theft assembly would ordinarily mount directly to the product being monitored, via securement to a universally mountable mounting member. The universally mountable mounting member together with the electronic anti-theft assembly, known collectively as a universal camera mount assembly, may then be secured to a camera by a fastener threaded into the camera's pre-existing tripod mount hole, since the majority of, if not all, cameras manufactured in the world today incorporate tripod mount holes.

In the preferred embodiment, a universal camera mount assembly is employed for operably connecting an anti-theft device in one of a plurality of orientations to a camera having a threaded tripod mount hole. The universal camera mount assembly comprises a mounting member for bringing an anti-theft sensor assembly in operable contact with the camera being monitored. The mounting member itself includes an upper surface and a lower surface through which a plurality of apertures for enabling adjustable attachment of the mounting member to the camera being monitored extend. The mounting member also contains a sensor region for fixedly attaching an anti-theft sensor assembly to the mounting member to enable operable contact of the sensor with the camera being monitored. An anti-theft sensor assembly is then fixedly attached to the

mounting member at the sensor region to, in turn, detect tampering with the camera being so monitored.

The plurality of apertures in the mounting member include at least three apertures where at least one of the apertures are not in linear alignment with at the least two other apertures. The at least three apertures extend from the upper surface to the lower surface of the mounting member so as to permit a portion of a first fastener to pass therethrough, for restrainable yet reorientable attachment of the mounting member and the anti-theft sensor assembly to the camera being monitored. The reorientable attachment extends into at least two substantially intersecting directions of movement to optimize the restrained positioning of the camera being monitored along the mounting member for mounting the anti-theft sensor assembly, in at least one preferred attachment position.

Preferably, the plurality of apertures in the mounting member includes a two dimensional array of at least two rows of apertures and at least two columns of apertures. Furthermore, the mounting member in the preferred embodiment is fixedly attachable to the camera being monitored using a first fastener to secure the mounting member to the camera by mated cooperation between the threaded tripod mount hole provided in the camera and the threaded portion of the first fastener. A secondary fastening device is preferably employed to also fasten the mounting member to the camera being monitored. The secondary fastening device may be double-sided adhesive member made of a substantially resilient and flexible material for restrainable affixing of the mounting member to the camera being monitored.

In the preferred embodiment, the anti-theft sensor assembly is composed of a housing having an interior region and an upper surface. The housing is configured to enable the anti-theft sensor assembly to be fixedly attached to the sensor region on the mounting member. The anti-theft sensor assembly includes a switch member for contacting the camera being monitored and is oriented substantially normal to an external surface on the camera. The housing contains an electronic circuit board for creating an electronic alarm signal upon interruption of the operable contact between the switch member and the surface of the camera being monitored. A signaling device indicates at least one of the presence and absence of operable, monitored contact between the switch member and the surface of the camera being monitored, which transmits an electrical signal to an alarm signaling device through a signal transmission medium.

The anti-theft sensor assembly in the preferred embodiment is fixedly attached to the sensor region on the mounting member using double-sided adhesive tape made of a substantially resilient and flexible material positioned between the sensor housing and the mounting member. The switch member of the anti-theft sensor assembly is biased into operable contact with the external surface of the camera being monitored.

In an alternative preferred embodiment, a universal camera mount assembly is employed for operably connecting an anti-theft device in one of a plurality of orientations to a camera having a threaded tripod mount hole. The universal camera mount assembly comprises a mounting member for carrying an

anti-theft sensor assembly in operable contact with the camera being monitored. The mounting member itself includes an upper surface, a lower surface, a first plurality of holes and a second plurality of holes for enabling adjustable attachment of the mounting member to the camera being monitored, and further includes a sensor region with a first threaded hole for fixedly attaching an anti-theft sensor assembly to the mounting member to enable operable contact with the camera being monitored. An anti-theft sensor assembly is fixedly attached to the mounting member at the sensor region for contacting the camera being monitored to, in turn, detect tampering with the camera being so monitored.

The first plurality of apertures are arranged in a first aperture region and the second plurality of apertures are arranged in a second aperture region The first aperture region is located adjacent to the sensor region on one side thereof and the second aperture region is located adjacent to the sensor region on the other side thereof. The first aperture region is arranged substantially opposite to the second aperture region along the mounting member. The first plurality of apertures in the mounting member further includes at least three first apertures with at least one of the at least three first apertures not in linear alignment with at least two of the other at least three first apertures. Likewise, the second plurality of apertures in the mounting member further comprising at least three second apertures with at least one of the at least three second apertures not in linear alignment with at least two of the other at least three second apertures. The at least three first apertures extending from the upper surface through to the lower surface of the mounting member to permit a threaded portion of a second

fastener to pass therethrough, for restrainable, yet reorientable attachment of the mounting member and the anti-theft sensor assembly to the camera being monitored. Likewise, the at least three second apertures extend from the upper surface through to the lower surface of the mounting member to permit a threaded portion of a second fastener to pass therethrough, for restrainable, yet reorientable attachment of the mounting member and the anti-theft sensor assembly to the camera being monitored. The reorientable attachment extending into at least two substantially intersecting directions of movement amongst each of the first and second aperture regions so as to optimize the restrained positioning of the camera along the mounting member for monitoring by the anti-theft sensor, in at least one preferred attachment position in at least one of the first and second aperture regions.

Preferably, the first plurality of apertures and the second plurality of apertures on the mounting member each includes a two dimensional array of at least two rows of apertures and at least two columns of apertures. In the alternative preferred embodiment, the mounting member is fixedly attachable to the camera being monitored using a second fastener to secure the mounting member to the camera being monitored by mated cooperation between the threaded tripod mount hole provided in the camera and the threaded portion of the first fastener. A secondary fastening device is employed to secondarily fasten the mounting member to the camera being monitored. The secondary fastening device comprises a double-sided adhesive member made of a

substantially resilient and flexible material for restrainable affixing of the mounting member to the camera being monitored.

In the alternative preferred embodiment, the anti-theft sensor assembly includes a switch member for contacting the camera being monitored and is oriented substantially normal to an external surface on the camera. Also included in the anti-theft sensor assembly is an electronic circuit board for creating an electronic alarm signal upon interruption of the operable contact between the switch member and the surface of the camera being monitored. A signaling device, indicates the presence and absence of operable monitored contact between the switch member and the surface of the camera being monitored, which transmits an electrical signal to an alarm signaling device through a single transmission medium. A second threaded fastener adapted to mate with the first threaded hole in the mounting member to secure the electronic circuit board to the mounting member. Preferably, the switch member of the anti-theft sensor assembly is biased into operable contact with the external surface of the camera being monitored.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view primarily of the lower surface of a preferred embodiment of the universal mount assembly with asymmetric placement of the camera mounting holes relative to the placement of the anti-theft sensor assembly;

Fig. 2 is a top plan view of the apparatus of Fig. 1 showing the upper surface of a preferred embodiment of the universal mount assembly;

Fig. 3 is a side view of a preferred embodiment of the universal mount assembly of Fig. 1;

Fig. 4 is a cross-sectional view taken along site lines 4 – 4 of Fig. 2, and looking in the direction of the arrows, showing a typical mounting scheme of the universal mount assembly once attached to a camera being monitored;

Fig. 5 is an exploded perspective view from underneath a camera showing a typical mounting orientation of the preferred embodiment of the universal mount assembly of Fig. 1 having extended sidewalls;

Fig. 6 is an exploded perspective view from above a camera showing a typical mounting orientation of the preferred embodiment of the universal mount assembly of Fig. 5;

Fig. 7 is an exploded perspective view from underneath a camera showing a typical mounting orientation of an alternative preferred embodiment of the universal mount assembly with symmetric placement of two sets of mounting holes, each having two dimensions of orientation; and

Fig.8 is an exploded view from underneath a camera showing a typical mounting orientation of yet another alternative preferred embodiment of universal mount assembly with countersunk holes, utilizing nonsymmetrical placement of the mount holes relative to the placement of the anti-theft sensor assembly.

DETAILED DESCRIPTION OF THE DRAWINGS

While this invention is susceptible of embodiment in many different forms, there are shown in the drawings and will be described in detail herein, several specific embodiments with the understanding that the present invention is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiments illustrated.

A preferred embodiment of a universal camera mount assembly **1** of the present invention is shown generally in Figs. 1-4. The universal camera mount assembly **1** includes a (universally mountable) mounting member **2** having an upper surface **3** and a lower surface **4**. The mounting member has a plurality of at least three mounting holes **5** (indicated in Fig. 2 as **5a – 5l**) that pass completely through the mounting member **2** beginning from the upper surface to the lower surface. The mounting holes **5** are oriented in any quantity of three or greater and in any pattern, but are shown in Figs. 1-3 as being oriented in linear rows and columns. The mounting member **2** has accommodations for placement of an electronic anti-theft sensor assembly **6** adjacent to the placement of the array of mounting holes **4** such that the array of mounting holes **4** is asymmetrically located with respect to the placement of the electronic anti-theft sensor assembly **6**.

In the preferred embodiment, the electronic anti-theft sensor assembly **6** may be secured to the mounting member by way of a layer of double-sided adhesive tape **7**, although any number of alternative fastening methods **8**, such as rivets, screws, etc, may be employed in combination with, or in place of, the

double-sided adhesive tape. The electronic anti-theft sensor assembly **6** may be positioned on any of the upper surface, the lower surface, or in recesses of the upper or lower surfaces on the mounting member **2**. The electronic anti-theft sensor assembly **6** includes an electro-mechanical switch **9** to enable operable contact with the article being monitored **10**, such as a video or still camera. The electro-mechanical switch **9** is biased against compression, preferably by employing a resistive spring, such that the electro-mechanical switch **9** will trigger an electrical signal if the switch is displaced a pre-determined amount from its compressed position. In this manner, an electro-mechanical switch **9** may be induced to make substantial contact with a surface of the camera being monitored **10** such that if contact is lost, an electronic signal is transmitted to an alarm system (not shown). The transmission of the electronic signal to an alarm system may be made utilizing any one of a variety of classical techniques, known in the art, including via a flexible electronic cable **11**, cellular or terrestrial telephonic systems, radio frequencies, infrared, electro-magnetic, and the like.

Fig. 4 represents a cross sectional view of Fig. 2 of the preferred embodiment taken along site lines "4 – 4" and looking in the direction of the arrows. The mounting member **2** mounted to the camera being monitored **10**, is preferably also affixed to the camera by double-sided adhesive tape **12** positioned between the camera **10** and the mounting member **2**. The double-sided adhesive tape **12** not only secures the mounting member **2** to the camera **10**, but also creates a bond between mounting member **2** and camera **10** so as to preclude direct access to anti-theft sensor assembly **6** thereby preventing

tampering with the functionality of the attached anti-theft sensor assembly **6** and its switch member **9**; by limiting access to switch member **9** when in contact with camera **10**. To further enhance the attachment between mounting member **2** and camera **10**, a fastener **13** is inserted through one of the mounting holes **5a-l** and is thereafter threaded into the pre-existing tripod mount hole that normally is present on a camera **10** to be monitored. The particular mounting hole **5a-l** used is dependent upon the configuration and location of the tripod mount hole present on camera **10**. The user should chose the mounting hole within mounting member **2** that provides substantial contact of the upper surface of mounting member **2** to camera **10** while still maintaining substantial contact of anti-theft sensor assembly **6** and switch member **9** with camera **10**. Upon securing the mounting member **2** to the camera being monitored **10**, the electro-mechanical switch of the invention **9** necessarily makes contact with an external surface of the camera thereby placing the anti-theft sensor assembly **6** in its operable position to begin detecting any detachment of the camera from the universal mount assembly. In the preferred embodiment, the electronic anti-theft sensor assembly **6** incorporates a signaling feature **14**, such as a light emitting diode, to serve as a visual alert to both the thief and the store personnel that intimate contact between the electro-mechanical switch **9** and a surface of the camera has been lost if the alarm circuit has been activated. The alarm activating signal may be carried from the anti-theft sensor assembly **6** to the alarm signaling device via a flexible electronic cable, cellular or terrestrial telephonic systems, radio frequencies, infrared, electro-magnetic, and the like.

Fig. 5 and Fig. 6 illustrate common mounting methods of embodiments of the invention, but with alternate depictions for the universal camera mount assembly **1**. The alternate embodiment shown of the universal camera mount assembly **1** in Figs. 5 and 6 shows a recessed cavity **15** for both the mounting holes and for placement of an anti-theft sensor assembly on mounting member **2** to protect anti-theft sensor assembly **6** from handling damage. In addition, the recessed cavity **15** provides a deterrent from enabling the anti-theft sensor assembly **6** from being pried away from or off of mounting member **2**.

Fig. 7 represents an alternate embodiment showing symmetrical placement of a pair of two-dimensional arrays of mounting holes **16**. In this embodiment, an electronic anti-theft sensor assembly **17** is positioned between the pair of mounting hole arrays **16**. Placement of arrays of mounting holes **16** on symmetrically on either side of anti-theft sensor assembly **17** permits greater flexibility in placement of mounting member **18** with respect to camera **10**, while maintaining substantial and operable contact of switch member of anti-theft sensor assembly **17** to camera **10**. The at least three apertures in each individual array **16** may be arranged in any geometric pattern or they be linearly ordered into rows and columns as shown, as long as at least one aperture is not in linear alignment with the other apertures that are aligned. The position of the apertures in the array on one side of the anti-theft sensor assembly **17** does not have to match or mirror the position of the apertures in the array on the other side.

The electronic anti-theft sensor assembly **17** may, as with the other embodiment, be positioned on either the upper surface, the lower surface, or in

recesses of the upper or lower surfaces of the mounting member **18**. This embodiment illustrates the inclusion of double-sided adhesive tape **19** as a secondary fastening means for securing the mounting member **18** to the camera being monitored **10**. As in the previous embodiment, double-sided adhesive tape **19** is a secondary fastening means to the primary fastening means of fastener **13** inserted into a mounting hole within the mounting hole arrays **16**. Fastener **13** would typically comprise a screw or other type of fastener known in the art.

Fig 8 represents yet another alternate embodiment illustrating the present invention. Mounting member **20,** shown without the attendant electronic anti-theft sensor assembly, contains placement of an array of countersunk mounting holes **21** that is nonsymmetrical with respect to the position of an electronic anti-theft sensor assembly. An array of countersunk holes **21** enable the use of countersunk fastener **22** to provide for a flush appearance of fastener **22** with respect to the lower surface **23** of the mounting member **20**. As in the other embodiments, double-sided adhesive tape **24**, is again shown as a secondary fastening means for securing mounting member **20** to camera **10** with primary securement being effectuated by fastener **22**. Fastener hole **25** in mounting member **20** is for attachment of the anti-theft sensor assembly (not shown) by typical attachment methods known in the art, such as screws, rivets and the like.

The foregoing description and drawings merely explain and illustrate the invention, and the invention is not limited thereto except insofar as the appended claims are so limited, as those skilled in the art who have the disclosure before

them will be able to make modifications and variations therein without departing from the scope of the invention.